AIM AirBox Pressure Controller Box User Manual

AIM ROBOTICS™

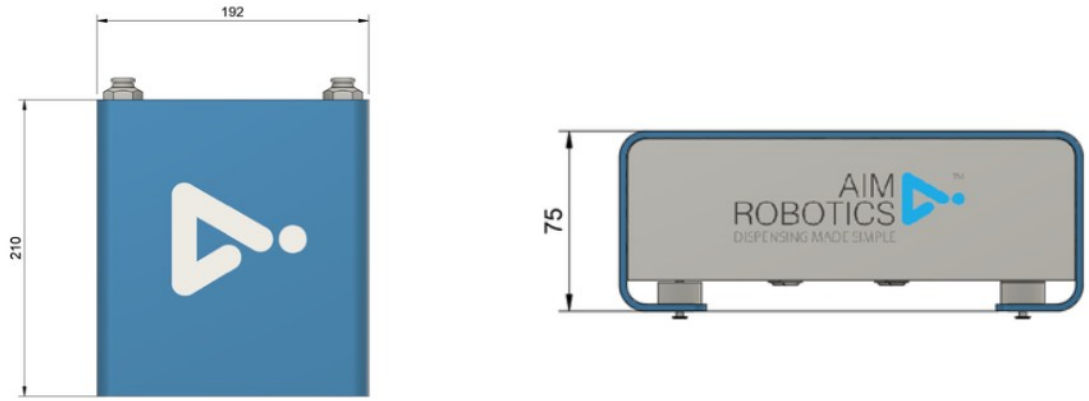
AIRBOX
USER MANUAL

Contents

AirBox Pressure Controller Box

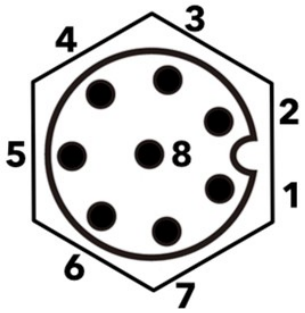
TECHNICAL DATA

- Full control via robot
- Over and Under Pressure monitor
- Intuitive URCap



Connection Diagram		
1	White	Set Pressure I/O
2	Brown	+24VDC
3	Green	Vacuum Switch I/O
4	Yellow	Inlet Pressure Sensor
5	Grey	Outlet Pressure Sensor
6	Pink	N/C
7	Blue	GND
8	Red	N/C

M12 8-pin pinout



Technical Data at 24V DC and 20 °C	
Dimensions	220 x 75 x 192 mm 8,65 x 2.95 x 7.55 inch
Supply Voltage	24 V DC ±10 % Ripple P-P 10 % or less
Current Consumption	Up to 1A
Air Input	Clean, dry air up to 8 bar 120 psi
Air Output	0.1-7.0 bar 1.5-100 psi
Short Circuit Protection	Incorporated
Response time	100 ms or less
Pressure Set Linearity	+/- 1% F.S. or less
Hysteresis	0.5% F.S or less
Operating temperature	-10 to +55 °C 14 to +131 °F (No dew condensation or icing)
IP Class	IP65 (IEC)
Housing Material	Aluminum 6061
Weight	1800g 4.0lbs

Model # AB
URCap version ≥1.0

INSTALLATION

1. Place the box in a convenient place in near vicinity to the robot
2. Plug-in cable in AirBox and connect it to the control box I/O using the color schematic seen on the back of the AirBox or in the datasheet

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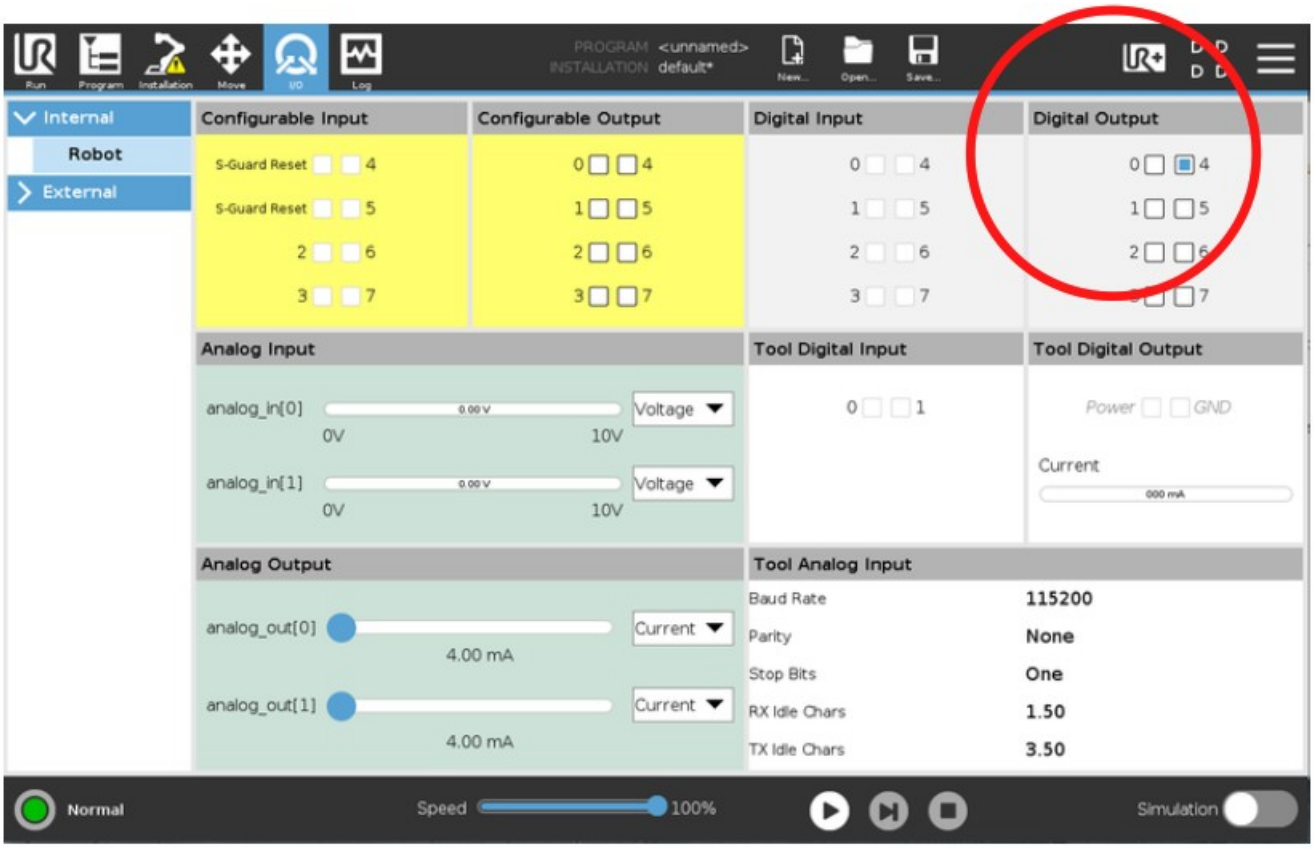
Control box			
0v	Blue	AG	
DO4	Brown	AI0	Grey
0V		AG	
DO5	Green	AI1	Yellow
0V		AG	
DO6		AO0	White
0V		AG	
DO7		AO1	

3. In the I/O tab  select Digital Output that matches where you connected the power. In this case DO4 as seen by the placement of brown wire in the illustration above.



SOFTWARE CONFIGURATION

1. Install URCap *

- If password protected:
  - Enter Manual Mode: Press and select manual
  - Enter Password
- If not protected by password:

- Press ☰ and select Settings > System > URCaps
- Press + symbol to add a new URCap: Navigate to a USB device and select Aim AirBox URCap

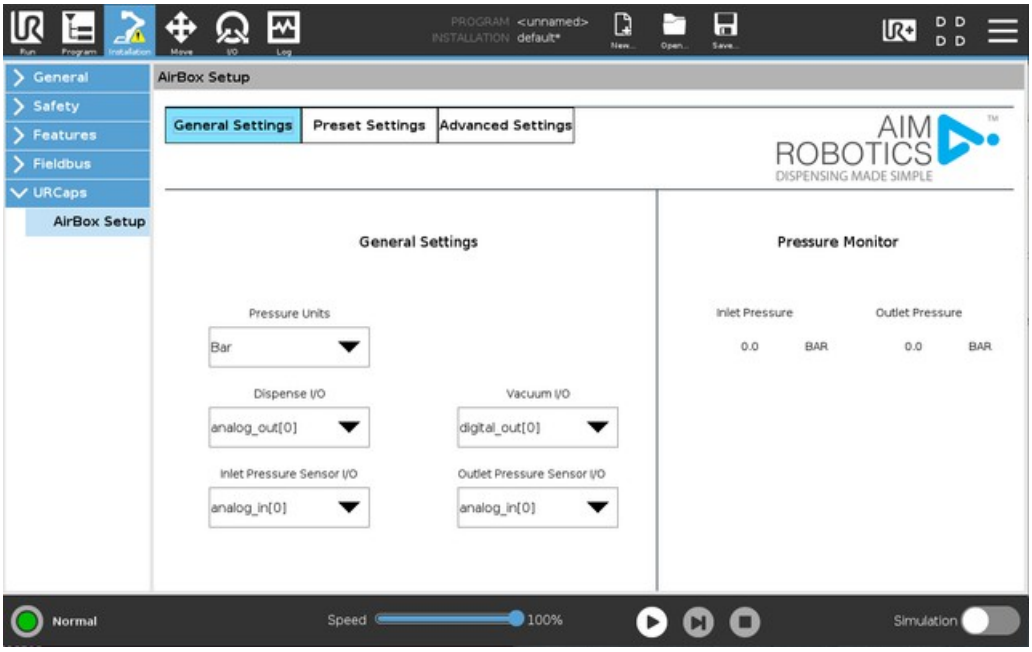
Accept when the robot prompts to restart before continuing.

*** Multiple URCaps**

- If multiple URCaps are installed the tool might not perform as intended.
- Some tools are programmed to take over and control the Tool IO and will not allow the Aim URCap to change the Tool IO.
- It is recommended to remove all other tool URCaps to avoid this OR ensure that Tool IO is controlled by the user and input manually entered as described in point 3. Installation of FD unit.
- If multiple URCaps are required, please use our Aim USB2RS485 kit.

INSTALLATION
AirBox Setup node in Installation

1. Go to the installations tap.
2. Go to the URCaps tap and choose AirBox setup.



General settings:

- Pressure Units: Select which unit you prefer. (Bar,PSI, hPa
- Dispence I/O: Select which analog output the output pressure-sensor is connected to. (White wire in control box).
- Inlet pressure sensor: Select which analog output the inlet pressure-sensor is connected to. (Yellow wire in control box).
- Vacuum I/O: Select which digital output the vacuum switch is connected to. (Green wire in control box).
- Outlet Pressure Sensor: select which analog output the inlet pressure-sensor is connected to. (Grey wire in

control box).

Pressure Monitor:

- Inlet Pressure: This is to monitor the high pressure Input for the AirBox.
- Outlet Pressure: This is to monitor the pressure going out of the AirBox for the dispenser (around 4 bars).

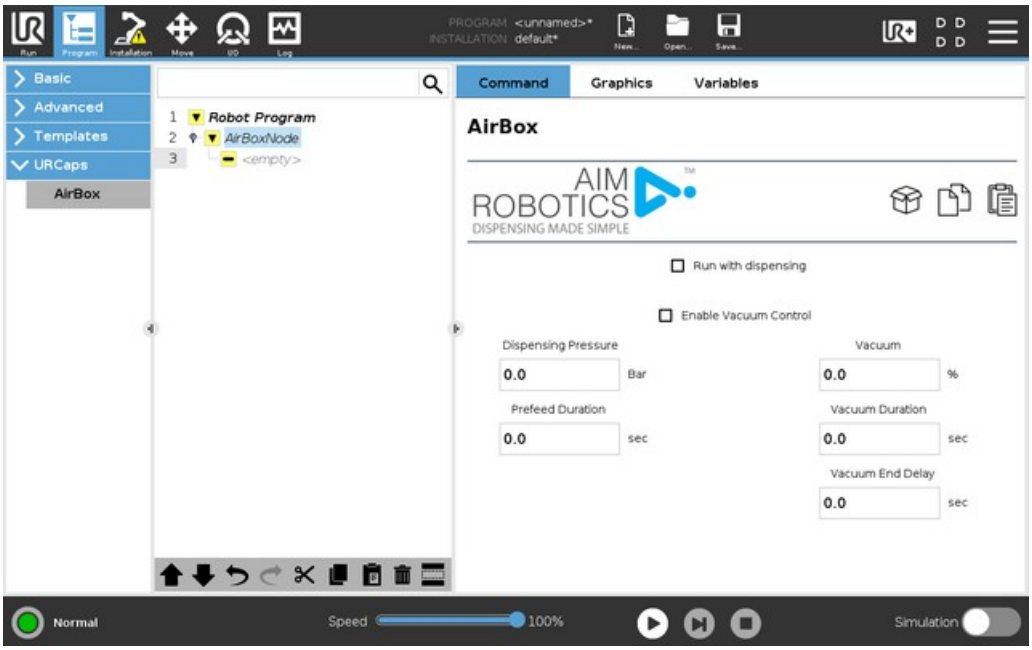
Note:
If Inlet Pressure and/or Outlet pressure dosn't fit what is applied, you can callibrate the sensors under the "Advanced settings" tap

PROGRAMMING

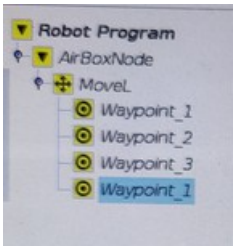
AirBox under URCaps under Program

How to use the AirBox to dispense

1. Go to URCaps
2. Find AirBox tap. An AirBoxnode will pop up in the program, and a setting page will show
   • Dispensing Pressure: This is where you insert how fast you want to dispense.
   This number depends of the viscosity of your medium, but is usually around 4 bar.
   • Prefeed Duration: Time the AirBox has to reach the desired pressure. This number is usually around 1 sec.
   This is done to assure a consistent flow when dispensing.
   • Enable Vacuum Control: The vacuum is used to stop the dispenser from dripping. If enabled it will activate right before the program moves on from the "AirBoxnode".
   • Vacuum: amount of vacuum applied. around 20-40% should be fine.
   • Vacuum Duration: This sets how long to hold the vacuum before moving on.
   • Vacuum End Delay: Delay to avoid dripping do to internal delay in AirBox. (usually around 0.5 sec is enough).

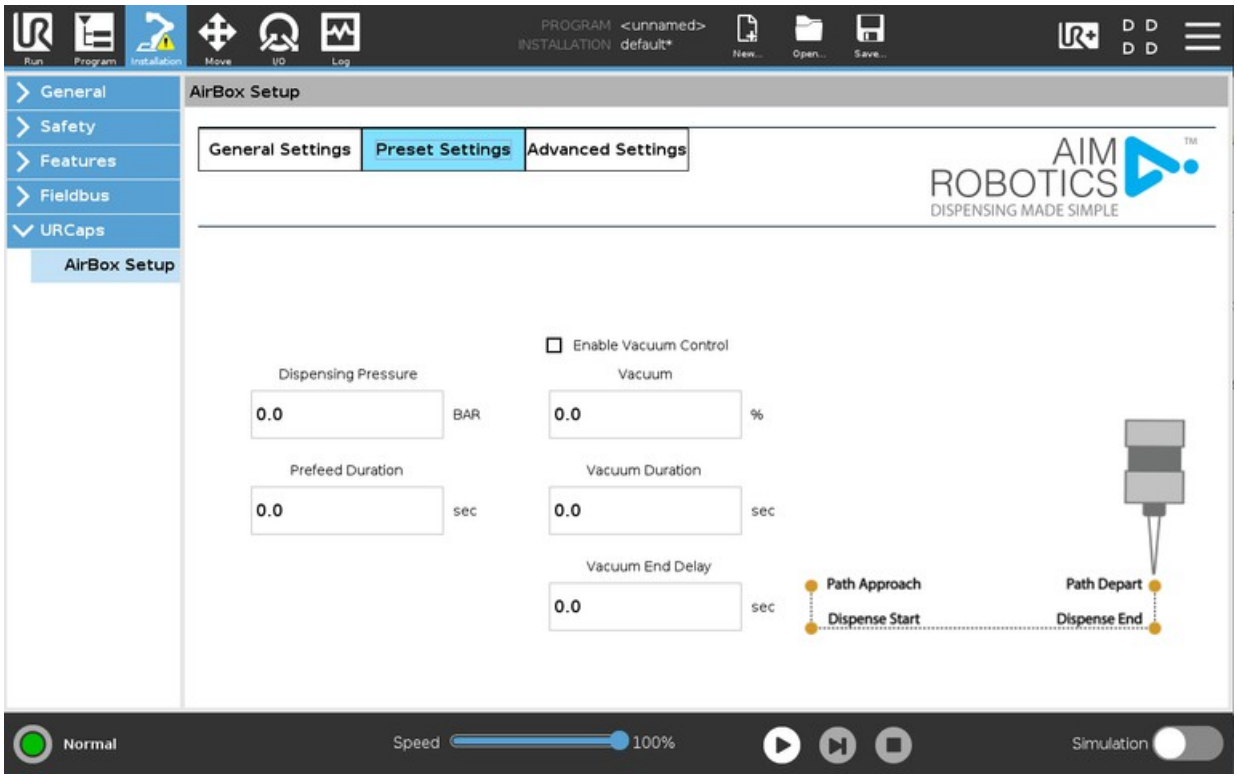


Inside the "AirBoxnode" you add a move command from the program tree and set the waypoints you want.



AirBox Setup node in Installation

Preset:
The settings from the AirBoxnode page can also be set beforehand in the preset settings tap under the AirBox setup in the installation tap. This makes it allot easier if you have the same settings you want to use multiple times in a program.
Go to the installation tap and chose URCaps and AirBox setup, and fill in everything like from the previous page.

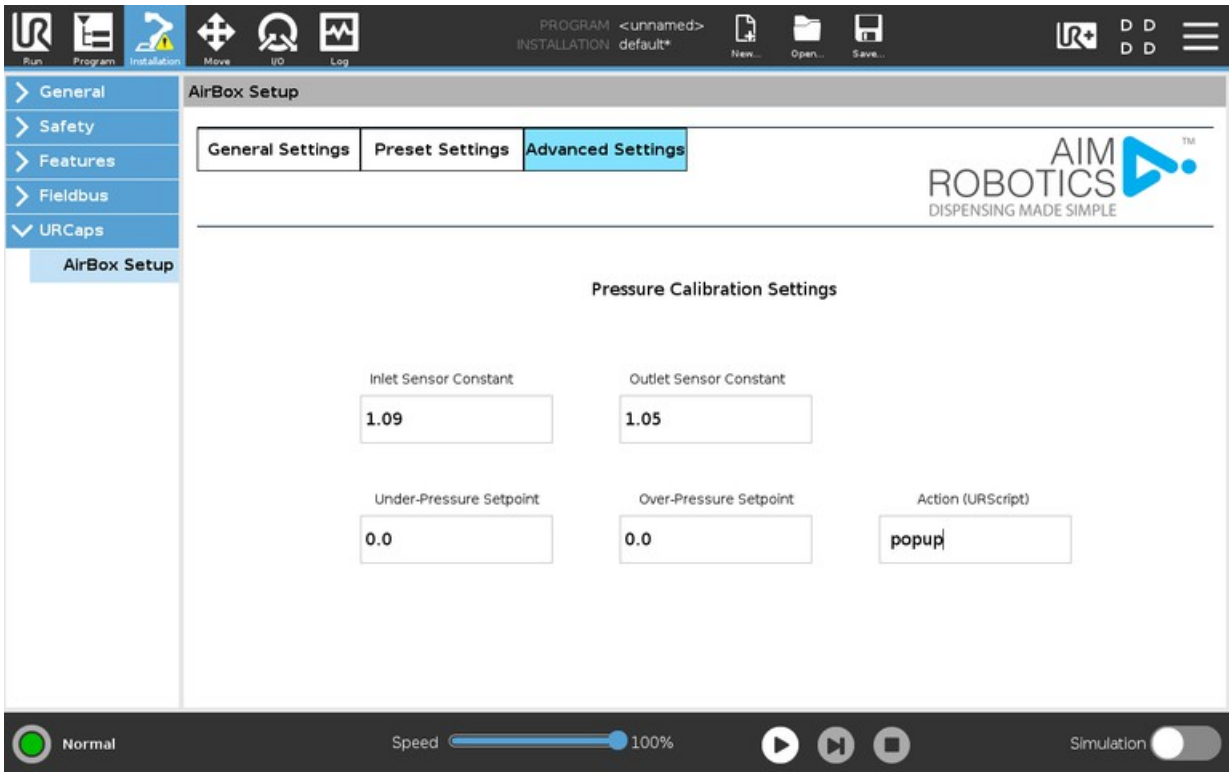


- Then, when you are done and want to use it in the program, just go to the program tap (see page 5) and find the AirBoxnode.
- In the AirBoxnode page you will find these the buttons: 
- Click the box icon and the page will fill with the preset values.

CALIBRATION

AirBox Setup node in Installation

Advanced settings



Pressure Calibration Settings:

- Inlet Sensor Constant: Adjust this to fix the value of the Input Pressure in the “General Settings tap” so it matches the value of the applied pressure.
- Outlet sensor constant: Adjust this to fix the value of the outlet pressure in the “General Settings tap” so it matches the value of the set pressure for the dispenser when the dispenser is active

These values can also be seen in the dropdown toolbar at the top. 

- Under-pressure setpoint: This allows for a pressure warning if the inlet pressure is under the set value
- Over-pressure setpoint: This allows for a pressure warning if the inlet pressure is over the set amount
- Action: Fill this with a URscript command to say whish action to be done when the above warnings happens

SAFETY

AVOID: Clamping between tips and work item

- Select the right (low) force settings in the safety system of the UR robot.
- Move slowly towards the work item.

AVOID: Entrapment of fingers / limbs
Entrapment of fingers or limbs can happen if the operator has extremities within the robot’s movement area.

- If possible select the right (low) torque/force settings in the safety system of the robot.
- Whenever possible limit rotational range of joint 6.
- Rotate at low speeds or when clearance to robot links is small.

Never use frayed, damaged or deteriorated hoses.

- Always store hoses properly and away from heat sources or direct sunlight. A hose failure can cause serious injury.
- Hose Reels can decrease your chances of injury, as well as help hoses last longer.

Trip Hazards
Avoid trip hazards that can occur when hoses are left on walkways or underfoot by paying close attention to the location of the air hoses in your facility and placing them out of the way when not in use.

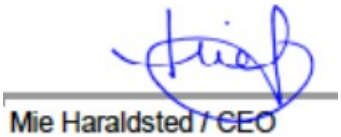
RECOMMENDATION
It is recommended that products from Aim Robotics are integrated into compliance with the following standards, technical reports, and specifications:

- ISO 10218-2:2012
- ISO 10218-1:2012
  - §5.10 and one or more of the requirements in 5.10.2 to 5.10.5
- ISO 12100:2011
- ISO/TR 20218-1:2018
- ISO/TS 15066:2016

CERTIFICATION

EU Declaration of Incorporation in accordance with ISOi IEC 17050-1.2010		
Manufacturer.	Aim Robotics ApS Maskinvej 5 DK-2860 Seborg Denmark	CSR 40494197 www.am-robotics.com
Description and identification of the partially completed machine(s)		
Product and Function:	Pneumatic dispensing controller	
Model:	AirBox	
Serial Number.	YEAR-model-sequential numbering restarting at 0 each year, starting from 2022-AB-0000	
Incorporation: The Aim Robotics product shall only be put into service upon being integrated into a final complete machine (robot system, cell or application), which conforms with the provisions of the Machinery Directive and other applicable Directives. When this incomplete machine is integrated and becomes a complete machine, the integrator is responsible for determining that the completed machine fulfils all applicable Directives, updating the relevant harmonized standards, other standards and documents.		
It is declared that the above product, for what is supplied, fulfil the following directives with reference to harmonised standards:		
I. Machinery Directive 2006/42/EC: It is declared that the relevant technical documentation has been compiled in accordance with Part B of Annex VII. A. EN 12100:2010 II. EMC Directive 2014/30/EU A.EN 61000-6-2:2005 B.EN 61000-6-4:2007/A1:2011 III. RoHS Directive 2011/65/EU A. EN 50581:2012 IV. WEEE Directive 2012/19/EU		
The relevant information on the partly completed machinery shall be transmitted in response to a reasoned request by the national authorities.		
Person authorized to compile the relevant technical documentation:		
Mie Haraldsted, CEO		Aim Robotics ApS Maskinvej 5 DK-2860 Seborg Denmark

signature



Seborg,
Denmark
24.08.2022

DESIGNED IN DENMARK BY AIM ROBOTICS APS
AIM-ROBOTICS.COM / CONTACT@AIM-ROBOTICS.COM

ORIGINAL INSTRUCTIONS (EN) VERSION 1.0

Documents / Resources

	AIM AirBox Pressure Controller Box [pdf] User Manual AirBox Pressure Controller Box, AirBox, Pressure Controller Box, Controller Box, Box

References

- Automated Robotic Dispensing Systems - Aim Robotics
- ROBOTICS.COM